

EXHIBIT 13
[UNREDACTED in the PUBLIC RECORD]

1 UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF
2 CALIFORNIA SAN JOSE DIVISION
3 CASE NO. 5:16-cv-00523-RMW

3 30 (b) (6) DEPOSITION OF SEAGATE July 26, 2017
4 TECHNOLOGY, LLC BY GLEN ALMGREN

5 IN RE SEAGATE TECHNOLOGY, LLC LITIGATION

6 APPEARANCES:

7 AXLER GOLDICH, LLC

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9 and

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13 Appearng on behalf of Plaintiffs.

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1 accelerated life testing in connection with
2 calculating AFRs?

3 A Yes. That's had reason that our test is
4 run at elevated temperature.

5 Q So what accelerated life testing is
6 performed in particular?

7 A In addition to the six-week demonstration
8 reliability testing, that test is extended out past
9 six weeks. The six-week number is what we use to
10 calculate our AFRs, but we keep the testing running
11 out past that and out past what customers will
12 ultimately test to to do exactly that, to -- it's a
13 long-term accelerated test that we use to ensure that
14 we don't have failure modes that exist even out past
15 the six-week test.

16 Q So -- so initially, there's a six-week
17 test period; is that right?

18 A Correct.

19 Q At a temperature, did you say it was 60
20 degrees Celsius?

21 A Yes.

22 Q And based on that test, you come up with
23 the AFR; is that right?

24 A That is right.

1 Q And then you extend the test past the six
2 weeks for purposes of accelerated life; is that
3 correct?

4 A Yeah.

5 Q How long do you -- do you run those tests,
6 those extended life tests?

7 A We run it at a minimum of nine weeks.

8 There can be -- there can be testing extended past
9 that, but it's typically nine weeks.

10 Q What sort of circumstances would there be
11 for a drive to need to do more than a nine-week
12 extension test?

13 MS. MCLEAN: Objection. Beyond the scope,
14 calls for speculation.

15 A Relative to Grenada?

16 Q (By Mr. Goldich) First, in general.

17 MS. MCLEAN: Same objections.

18 A In general, we do -- we do longer testing
19 for our Enterprise test drives because of the
20 environment they're in and the longer warranty period
21 of Enterprise drives versus Desktop drives.

22 Q (By Mr. Goldich) So typically for a
23 Desktop drive, you would do a nine-week accelerated
24 life beyond the six-week test, and you wouldn't

1 extend beyond that nine weeks, correct?

2 A We wouldn't extend beyond -- beyond the
3 nine weeks as a whole, typically would not.

4 Q Did you extend beyond nine weeks with
5 Grenada?

6 A I don't recall.

7 Q So what is six weeks in testing equivalent
8 to in realtime?

9 MS. MCLEAN: You're talking about the AFR
10 calculation?

11 Q (By Mr. Goldich) For the AFR calculation.

12 A Well, we -- we use the AFR -- the data for
13 those calculations to assume at a minimum of the
14 one-year field performance. Testing itself from a
15 right read through put standpoint actually
16 demonstrates three to five years' worth of an end
17 user's actual usage of the drive.

18 Q So the six weeks is intended to simulate a
19 minimum of one year, and potentially three to five?

20 A Correct.

21 Q Do you perform thermal surveys in
22 connection with your AFR testing?

23 A What do you mean, thermal surveys?

24 Q To test the temperature of certain parts

1 Q And were the tests ongoing at the time of
2 this writing?

3 A Yes.

4 Q Okay. So it's 433 hours out of how many?

5 A We'll run for six weeks or 1,008 hours.

6 Q So it was almost halfway finished?

7 A Correct.

8 Q All right. What about this next sentence
9 here?

10 A "The key learning from this regression
11 will be the reduction of degrade readers and new
12 media defects."

13 Q Okay. So what -- what does this mean?

14 A What this means, there was -- excuse
15 me -- what this means, there was a need to
16 demonstrate an improvement for degrade readers, and
17 then also for new media defects. So those would have
18 been two failure modes that would have been
19 encountered in testing prior to MAT 2.0.

20 Q The next sentence says, "Currently demo
21 101k MTBF and potential of 167k," right?

22 A Correct.

23 Q And what does that mean?

24 A What that means is where the product is

1 currently demonstrating 101k or 101,000 hours. So
2 101,000 is basically the number -- the MTBF, the
3 units are in time. So this is saying it's 101,000
4 MTBF. That's what's being demonstrated, and then
5 there's a projection or a potential of 167,000 hours.

6 Q Okay. So -- so the drives were currently
7 demonstrating 101,000 mean time between failures,
8 correct?

9 A Correct.

10 Q And a potential of 167,000 mean time
11 between failure, correct?

12 A Correct.

13 Q And the potential is a -- is an estimation
14 based on what exactly?

15 A It's an estimation based on fixes that are
16 upcoming, but may not be validated yet.

17 Q Okay. So you identify problems, for
18 instance in this case, degrade readers and new media
19 defects, right?

20 A Correct.

21 Q You propose a corrective action or fix,
22 correct?

23 A Correct.

24 Q And then you calculate the change and the

1 mean time between failure after the corrective action
2 is implemented?

3 A Yes. When the corrective action is
4 implemented and demonstrated, that's that 101k MTBF
5 number.

6 Q Oh, I see. So the corrective action was
7 actually implemented to get the 101,000 mean time
8 before failure?

9 A Correct. Right.

10 Q And the potential is if all the corrective
11 actions work?

12 A No. No. The -- the corrective actions
13 work to get to that 101k number. The potential is --
14 the way to think of that is if there was something
15 that is coming in two weeks, for example, but it's
16 not -- it's not there, but it's coming, and we know
17 that it's going to provide an improvement. It's
18 really just that. It's really just a projection of
19 maybe the next -- the next step function up --

20 Q Okay.

21 A -- in reliability.

22 Q I think I understand.

23 MS. MCLEAN: Let's try not to step on each
24 other's questions and answers.

1 A Yes.

2 Q Okay. Now, under this MTBF chart, we have
3 the word demo, which means demonstrated, right?

4 A Yes.

5 Q And then it says, "Validated end
6 potential," and earlier we were discussing validated
7 end potential in terms of corrective action, right?

8 A Yes.

9 Q Okay. So is it correct that the
10 demonstrated mean time before failure on April 27,
11 2011 was 101,000, right?

12 A Correct.

13 Q And that was after certain corrective
14 actions were taken?

15 A Correct.

16 Q And the potential, as we saw in the
17 Executive Summary, was calculated to be 167,000?

18 A Correct.

19 Q Under there, we have the word goal, and
20 again, we have some columns that relate to phases,
21 right?

22 A Yes.

23 Q Okay. So we have the GEN2 phase, and that
24 states 50k, right?

1 percent of your population fall out.

2 Q Why 63.2 percent?

3 A That's just the characteristic of the
4 math. It's the distribution, you know. It's nothing
5 that is related to our testing or anything within
6 Seagate. It's the characteristic of the Weibull
7 distribution itself.

8 Q Do you know why Seagate uses the Weibull
9 distribution as opposed to an exponential
10 distribution or some other reliability model? I
11 believe there are four of them, Weibull being one.

12 A It's ultimately been the distribution that
13 has fit the data the best.

14 Q Any reason why it fits best?

15 A What it does, with typical hard drives,
16 you have -- if you've heard of the bathtub curve,
17 it's not just with hard drives, it's with anything
18 reliability-focused. There are -- there can be
19 distinct phases of, you know, infant mortality versus
20 kind of a reduced failure rate versus a wear-out
21 mechanism, and the Weibull distribution is able to
22 model those very well.

23 Q Does Seagate test all of its drives with
24 the Weibull beta that's .608098?

1 A No. That number is based on the data of
2 this test bed that we are looking at right here.

3 Q How do you come to that figure for the
4 Weibull beta?

5 A Well, you need a few pieces of data. You
6 need to know the number of units in the test, which
7 you have at 1651; you need to know the test time for
8 the population; and then you need to know the time of
9 failure for any individual serial number that is in
10 this.

11 Q What's a gamma distribution?

12 A What's a gamma distribution?

13 Q Yeah.

14 MS. MCLEAN: And where are you referring
15 to?

16 Q (By Mr. Goldich) I'm just asking what a
17 gamma distribution is, if you know, related to the
18 reliability testing.

19 MS. MCLEAN: I'm going to object to lacks
20 foundation.

21 A I don't know. I don't know.

22 Q (By Mr. Goldich) What about chi squared?

23 MS. MCLEAN: Objection. Lacks foundation.

24 A What about chi squared?

1 Q So you're referring to the additional
2 testing beyond the six weeks?

3 A Yes, correct.

4 Q Has the Weibull ever been set to 1 or
5 greater than 1 for -- for AFR testing of drives at
6 Seagate?

7 A For Grenada drives?

8 Q Let's start with Grenada.

9 A Not to my knowledge. I don't believe
10 we've ever had a Weibull beta or greater. We don't
11 set it. It's calculated from the data.

12 Q Right.

13 A Right.

14 Q Has anyone ever suggested that -- that the
15 data that Seagate's collected about its drives would
16 support having a Weibull of 1 or greater than 1 for
17 its reliability testing?

18 MS. MCLEAN: Objection. Vague, lacks
19 foundation.

20 Q (By Mr. Goldich) Do you know?

21 A For Grenada?

22 Q For reliability testing generally.

23 A That we should set the beta to 1 or
24 greater?

1 Q Yes.

2 MS. MCLEAN: Objection. Vague, lacks
3 foundation, overbroad.

4 A No. We wouldn't -- we wouldn't
5 specifically set the beta to anything. We would let
6 the beta come out of the data.

7 Q (By Mr. Goldich) Do you use field data
8 to -- to do reliability testing?

9 MS. MCLEAN: Objection. Vague, lacks
10 foundation.

11 A Not to go to do reliability testing. Do
12 we look at field data? Yes.

13 Q (By Mr. Goldich) When do you look at
14 field data in connection with reliability in general?

15 MS. MCLEAN: Objection. Mischaracterizes
16 testimony.

17 A We look at field data. One of the groups
18 earlier in that that I mentioned, they look at field
19 data. I'm not involved in that as much from a field
20 standpoint, but Seagate does look at field data.

21 Q (By Mr. Goldich) That's because you're
22 pre-release, right?

23 A Correct.

24 Q So there would be ongoing reliability

1 testing itself even before it comes to reliability
2 testing.

3 Q Gotcha. "Fixed validation. Validation
4 based MAT 1.2, 1.3 BTC failure rate the first 180
5 hours versus MAT 2.0." Is this stating that this
6 corrective action was -- was confirmed as a fix
7 during these tests?

8 A Yes, more specifically in the MAT 2.0
9 test.

10 Q And there were 23 of these head
11 instability failures, right?

12 A Correct.

13 Q And it says here that the percent of
14 failure is 1.243 percent, right?

15 A Correct.

16 Q What's the -- how -- what's the 1.243
17 percent of? Is it of 1651 drives?

18 A It's 1.243 percent of the -- that's that
19 relative component of the 7.006 percent in the top
20 left.

21 Q Okay.

22 A So of that 7.006 percent raw number, that
23 mode we're saying it is making up 1.24 of that.

24 Q Okay. Next to that, it says,

1 STATE OF COLORADO) .

2 ss) . REPORTER'S CERTIFICATE

3 COUNTY OF DENVER) .

4 I, Brittany D. Leis, do hereby certify that
5 I am a Court Reporter and Notary Public within the
6 State of Colorado; that previous to the commencement
7 of the examination, the deponent was duly sworn to
8 testify to the truth.

9 I further certify that this deposition was
10 taken in shorthand by me at the time and place herein
11 set forth, that it was thereafter reduced to
12 typewritten form, and that the foregoing constitutes
13 a true and correct transcript.

14 I further certify that I am not related to,
15 employed by, nor of counsel for any of the parties or
16 attorneys herein, nor otherwise interested in the
17 result of the within action.

18 In witness whereof, I have affixed my
19 signature this 4th day of August, 2017.

20 My commission expires December 13, 2017.

21

22

23

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